CLAIMS

What is claimed is:

1. An apparatus for cutting and stacking rolls of sod comprising:

a wheeled chassis for traversing a sod field;

a horizontal cutting mechanism for cutting a plurality of sod strips;

an accumulator configured to hold the plurality of sod strips;

a sod roller configured to roll the sod strips prior to transferring the sod to the accumulator;

a conveyor configured to transfer sod from the cutting mechanism to the accumulator; and

a robotic arm configured to lift the plurality of sod strips from the accumulator to a sod storage location.

2. The apparatus according to Claim 1 wherein the accumulator is a segmented conveyor.

3. The apparatus according to Claim 1 wherein the accumulator comprises a retractable portion which allows an operator to return a rejected sod roll to the sod field.

4. The apparatus according to Claim 3 further comprising a ramp disposed below the retractable portion.

5. The apparatus according to Claim 3 wherein the robotic arm comprises a horizontal pick-up head having a plurality of gripper modules, each gripper module configured to engage a separate individual sod roll.

6. The apparatus according to Claim 5 wherein each gripper module comprises a pair of engageable fingers, the engageable fingers being configured to be rotatably positioned to engage a roll of sod positioned in the accumulator.

7. The apparatus according to Claim 6 wherein the fingers are coupled to a gripper actuator, the gripper actuator having an extended position whereby the fingers are rotated into a position below a concave stripper.

8. The apparatus according to Claim 6 wherein the fingers are coupled so as to cause the fingers to engage the separate sod rolls simultaneously.

9. The apparatus according to Claim 6 wherein the horizontal pick-up head has a separator mechanism configured to cause movement of at least one gripper module with respect to another gripper module.

10. The apparatus according to Claim 6 further comprising a controller configured to regulate the movement of the robotic arm.

11. The apparatus according to Claim 10 wherein the robotic arm is hydraulically driven and the controller is configured to control at least one hydraulic valve.

12. The apparatus according to Claim 10 wherein the controller is electronically coupled and configured to control the gripper modules.

13. The apparatus according to Claim 10 wherein the controller is coupled to a plurality of actuators which are configured to keep the horizontal pick-up head horizontal.

14. The apparatus according to Claim 10 further comprising a pair of forks configured to support a pallet in the sod storage location, said controller configured to control the movement of the forks from the first pallet location to a second pallet location.

15. The sod harvester for removing sod from a sod field and placing rolled sod into a pyramidal stack comprising:

a wheel to chassis having a sod storage location configured to support the skid;

a robotic arm coupled to the chassis, said robotic arm having a horizontal pick-up head, the horizontal pick-up head having a plurality of gripper modules, each gripper module configured to simultaneously engage a sod roll.

16. The sod harvester according to Claim 15 wherein the robotic arm is configured to simultaneously move the plurality of rolls of sod from in an accumulator to the palletized skid.

17. The sod harvester according to Claim 16 further comprising a horizontal cutting mechanism configured to cut sod into strips.

18. The sod harvester according to Claim 17 further comprising a conveyor disposed between the horizontal cutting mechanism and the accumulator.

19. The sod harvester according to Claim 18 further comprising a means for rolling sod strips.

20. The sod harvester according to Claim 19 further comprising a mechanism configured to transfer the sod from the conveyor to the accumulator.

21. The mechanism according to Claim 20 wherein the accumulator is a segmented, indexed conveyor.

22. The mechanism according to Claim 21 wherein the accumulator further comprises a retractor mechanism which retracts a portion of the accumulator from a first position to a second position, and wherein a sod roll will drop to the sod field when the portion of the accumulator is in its first position.

23. A numerically-controlled robotic manipulator arm mounted to a sod harvester, comprising:

two segments pivotally attached to one another;

one segment rotatably attached to a fixed base on the mobile vehicle; and

the second segment rotatably attached to a pick-up head, said pick-up head being capable of picking up, holding, and releasing sod rolls, said numeric controls being programmable for a variety of stacking configurations.

24. A robotic arm for transporting a plurality of sod rolls comprising:

a base;

a first member rotatably coupled to the base at the first member proximal end;

a second member rotatably coupled to the base at a second member proximal end;

a first linkage member rotatably coupled to a first distal end of the first member and rotatably coupled to a second distal end of the second member;

a third member rotatably coupled to the first linkage at a third member proximal end;

a fourth member rotatably coupled to the first linkage at a fourth member proximal end;

a second linkage rotatably coupled to the third member at the third member distal end, the linkage being rotatably coupled to the fourth member at the fourth member distal end; and

a horizontal head member having a plurality of grippers, each gripper having at least one pair of retractable fingers.

25. The robotic arm according to Claim 24, further comprising a first actuator disposed between the base and the first member, and a second actuator disposed between the first member and the third member.

26. The robotic arm according to Claim 24 wherein each gripper comprises a gripper actuator coupled to the pair of fingers.

27. The robotic arm according to Claim 24 wherein each gripper further has a concave stripper disposed between the fingers.

28. The robotic arm according to Claim 24 wherein all the fingers are configured so as to actuate simultaneously.

29. The robotic arm according to Claim 24 wherein the horizontal head member comprises a support frame rotatably coupled to the second linkage and an actuator coupled between the frame and the second linkage which is configured to maintain a predetermined angle between the frame and the vehicle.